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A Comparison of the Views of Internal Controllers/Auditors and Branch/Call Center Personnel of the Banks for Operational Risk: A Case for Turkish Banking Sector

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Abstract

The aim of this paper is to compare the views of internal controllers/auditors and branch/call center personnel of the banks with respect to the operational risk. Within this scope, we made two different surveys to the personnel in Turkish banks in order to achieve this objective. The first survey was conducted by 310 branch and call center personnel whereas 151 personnel in internal control and audit departments of the banks carried out the second survey. The major finding in this study is that there is a difference in the views of these two groups regarding the evaluation of operational risk. In general, internal controllers/auditors look at the operational risk more negatively than branch/call center personnel. The personnel who control and audit operations in the bank think that operational risk knowledge level of branch/call center personnel is less sufficient, operational risk levels are higher, the controls to avoid this risk are less efficient than branch/call center personnel consider.

Keywords: *Banking; Operational Risk; Turkey; Risk Management; Basel Committee*

JEL classification: *C83, G21, G32*

Introduction

Banks play a key role for the economies of the countries because they make a connection between investors and depositors. Especially after globalization, the importance of banking sector increased very much. This situation also led to raise the risks banks are subject to. Because banking sector is essential, any problem related to this sector will affect the whole economy negatively. Due to this problem, bank tried to take some actions in order to manage these risks (Santomero, 1997).

Operational risk is one of the most important risks of the banks. It is mainly defined as all risks other than credit and market risks. It contains internal process of the banks, mistakes of personnel and external factors such as earthquake. If this risk cannot be managed by the banks effectively, it may cause abnormal losses to the banks. Owing to this issue, Basel Committee gave very much importance to the calculation of operational risk in banking sector (Davies, et. al., 1998).

Similar to this situation, in the past, there are some examples in which banks had a high amount of loss because of not managing operational risk effectively. For example, Barings Bank went bankruptcy due to the speculation of a trader (Tickell, 1996). Another example of this situation is the collapse of Daiwa Bank. Because the risk management is not efficient in this bank, it suffered from 1.1 billion $ loss because the fraud of a personnel (Chiou, 1999). Thus, studies related to the operational risk are essential. Owing to the analysis results of these studies, it will be possible to understand deficient parts of the banks regarding operational risk.

There are lots of studies in the literature related to the operational risks. Most of them tried to suggest a new model in order to calculate operational risk more effectively. The main reason behind this situation is that many people think that existing operational risk calculation methods are inadequate. On the other hand, there are only a few studies about operational risk in Turkish banking sector and most of them analyze the effectiveness of calculation methods. However, there was not a study, which examines the level of operational risk in Turkish banking sectors.

When taking into the consideration of these factors, in this paper, we tried to make an evaluation of operational risk according to the views of both internal controllers/auditors and branch/call center personnel of the banks. In order to achieve this objective, we made two different surveys to personnel who work in Turkish banks. The first survey was conducted by 310 branch and call center personnel and 151 personnel in internal control and audit departments of the banks carried out the second survey. As a result of this analysis, it will be possible to understand the level of operational risk in Turkish banking sector and make necessary recommendation for this situation.

The paper is organized as follows: in first part, we describe the definition of operational risk and different methods to calculate this risk. Moreover, the second part provides literature review related to operational risk. Also, third part includes research and application to understand the level of operational risk in banking sector. Finally, the results of the analysis were given at conclusion.

Literature Review

Operational Risk in Banking Sector

Operational risk is mainly defined as the risks of the bank other than credit and market risks. In general definition, it refers to the risks of the banks caused by inefficient internal process, incorrect implementation of personnel and external factors (Basel Committee, 2011). As it can be understood from this definition, operational risk is most common risk that is encountered in daily business process. Operational risk mainly contains four different aspects, which are people, system, process and external factor (Van Den Brink, 2002).

People based operational risk includes mistakes of personnel. This mistake can be both intentionally or accidentally. Moreover, system based operational risk involves the problems related to system used in the bank. Technical problems in the computers, virus and security vulnerability in the system are some examples of this type of operational risk. In addition to them, aggressive sales that violate ethic

rules and illegal campaign show process based operational risk. Finally, external factors, such as earthquake, flood and terrorist attack are also accepted as operational risk for the banks.

Calculation of operational risk is more difficult in comparison with other risks. The main reason for this issue is that collecting data related to operational risk is not easy. Therefore, in order to be helpful for this problem Basel Committee suggested 4 different approaches.

Basic Indicator Approach: This is the simplest approach of calculating operational risk. A specific ratio of annual income of banks is determined as operational risk in this approach (Altıntaş, 2006).

Standard Approach: It is a more detailed approach in comparison with basic indicator approach. The main difference is that annual income is calculated for different divisions of the banks instead of using just one (Leblebici Teker, 2006).

Alternative Standard Approach: In this approach, instead of income, the loan amount is considered for retail and commercial banking divisions because their profit margin is higher than others (Leblebici Teker, 2006).

Advanced Measurement Approach: It is accepted as the best approach in order to calculate operational risk. According to this approach, banks can use internal data in calculation process (Üçgün, 2010).

There are a lot of studies related to operational risk in the literature. Some of them were emphasized on the table below.

Table 1: Studies Related to Operational Risk

Author	Scope	Method	Results
Power (2003)	Literature Review	General Description	They identified the key points so as to calculate operational risk effectively.
Embrechts, et. al., (2003)	Literature Review	Extreme Value Theory	They created a model to calculate operational risk of the banks correctly.
Moscadelli (2004)	Italy	Extreme Value Theory	It was concluded that conventional models have lower performance in order to calculate operational risk.
Cornalba and Giudici (2004)	Literature Review	Bayesian Approach	They proposed a new model based on Bayesian approach to calculate operational risk.
Leblebici Teker and Ülengin (2005)	Turkey	Descriptive Statistics	The amount of operation risk was calculated less in internal measurement approach.
Chavez-Demoulin, et. al. (2006)	Literature Review	Descriptive Statistics	They represented some techniques that depend on loss process to be helpful in calculating operational risk.
Neslehova, et. al. (2006)	Literature Review	Extreme Value Theory	They created a model in order to calculate operational risk.
Dutta and Perry (2006)	USA	Descriptive Statistics	They provided a new technique regarding operational risk measurement and concluded that this model has better performance than others.
Chambers and Çifter (2007)	Turkey	Descriptive Statistics	A distribution method was recommended in order to combine internal and external data of the banks.
Degen, et. al., (2007)	Denmark	Extreme Value Theory	It was determined that quintile estimation using extreme value theory may provide inaccurate results if the data is modeled by h and g distribution.
De Fontnouvelle (2007)	6 International Banks	Simulation	It was identified that the results are similar for each bank according to internal operational loss data.
Uysal (2009)	Turkey	Descriptive Statistics	Banks should make some works that include subjective criteria so as to calculate operational risk.
Michalski (2009)	Poland	Descriptive Statistics	He offered a new model that uses portfolio management theory as part of operational risk management.
Erdoğan and Ülbeği (2009)	Turkey	Survey	The expectations of bank personnel related to operational risk can change according to the demographic properties.
Izhar (2010)	Literature Review	General Description	The absence of significant amount of loss data is a problem that hinders Islamic banks to implement more sophisticated methods regarding operational risk calculation.
Bodur (2012)	Turkey	Descriptive Statistics	They concluded that a case was not accepted as an operational risk before it was actualized.
Bryce, et. al. (2013)	England	Theory of Planned Behavior (TPB)	It was identified that there is a negative correlation between operational risk level with education and training.

Bayrakdaroğlu and Yalçın (2013)	Turkey	Fuzzy analytic hierarchy process (FAHP)	It was determined that state-owned and privately-owned commercial banks in Turkey have differentiated with respect to the operational risk.
Moosa and Li (2013)	England	Descriptive Statistics	It was concluded that loss severity does not depend on the size of the firms.
Sturm (2013)	Europe	Regression	As a result of the analysis, it was defined that banks with a high liabilities to assets ratio suffers from operational loss very much.
Willesson (2014)	Nordic banks	Regression	It was identified that there is a positive relationship between operational risk and the size of the banks.
Habib, et. al. (2014)	Pakistan	Survey	They found that effective operational risk management increases the performance of the banks.
Kraujalis, et. al. (2015)	6 banks that have largest operational risk	Descriptive Statistics	It was identified that advanced measurement approaches give better results of operational risk.
Eckert and Gatzert (2015)	USA	Descriptive Statistics	It was concluded that reputational loss should be taken into the concentration within the scope of operational risk.
Saeed (2015)	Malaysia	Regression	It was found that operational risk has significant influence on ROE of the banks.
Han, et. al. (2015)	China	Peaks over Threshold (POT) model	It was determined that the internal fraud is the main type of operational risk in Chinese commercial banks
Rahim, et. al. (2015)	Malaysia	Survey	It was defined that there is a negative relationship between customer complaint and operational risk.
Liu and Cortes (2015)	Taiwan	Stochastical Frontier Approach	They concluded that banks can improve their performance with the help of effective operational risk management.
Rahman and Yazid (2015)	Malaysia	Survey	It was identified that training, education, experience and compensation provides better management of operational risk.
Mitra, et. al. (2015)	5 different countries	Descriptive Statistics	It was found that operational risk is higher in emerging market firms than in the developed markets.
Tominac and Palijan (2015)	Croatia	Descriptive Statistics	Most of Croatian banks prefer to use standard approach as for operational risk calculation.
Ames, et. al. (2015)	USA	Descriptive Statistics	They provided 3 different suggestions in order to calculate operational risk more accurately.
Scannella and Brandi (2015)	Literature Review	Monte Carlo Simulation	It was concluded that effective operational risk management reduces bank capital requirement.
Li and Moosa (2015)	53 countries	Descriptive Statistics	They reached a conclusion that operational risk is negatively related to governance indicators
Chernobai, et. al. (2016)	USA	Panel Data Analysis	It was concluded that there was an increase in the amount of operational loss for American banks during the period between 1996 and 1999.

Curti, et. al. (2016)	USA	Advanced Measurement Approach	They offered 5 principles in order to ensure robustness for operational risk benchmark.
Chaudhuri and Ghosh (2016)	India	FAHP and TOPSIS	Fuzzy analytic hierarchy process (FAHP) and technique for order preference by similarity to ideal solution (TOPSIS) are very helpful in order to decrease the uncertainty in the operational risk data.
Wang, et. al. (2016)	China	Loss Distribution Approach	Operational risk amount of Chinese banks was calculated as 248 billion CNY by using loss distribution function.
Haldar and Rao (2016)	India	Regression	It was determined that there is very little evidence on operational risk management and its relationship with size and ownership for Indian banks.
Liu (2016)	China	Loss Distribution Method	As a result of the analysis, it was defined that Chinese banks are not suitable to use loss distribution method.

Source: Authors

As it can be seen from the table above, in most of the studies, a new model was suggested in order to calculate operational risk more accurately (Embrechts, et. al., 2003), (Cornalba and Giudici, 2004), (Chavez-Demoulin, et. al., 2006), (Neslehova, et. al., 2006), (Dutta and Perry, 2006), (Chambers and Çifter, 2007), (Michalski, 2009). The main reason why these authors preferred to create a new model is that it was believed that existing models are not sufficient so as to define the operational risk amount of the banks. Apart from all these, the most common discussion related to operational risk management is about the quality of calculation methods. Within this scope, Moscadelli (2004), Leblebici Teker and Ülengin (2005), Degen and others (2007), Uysal (2009) and Kraujalis and others (2015) concluded that conventional models have lower performance than advanced models in order to calculate the performance of the banks.

In addition to them, in some other studies, operational risk of the banks was analyzed and the factors, which affect operational risk, were defined as a result of this analysis. Bryce and others (2013) and Rahman and Yazid (2015) emphasized that higher education level and training decrease operational risk. Moreover, Willesson (2014) found that there is a positive relationship between size of the banks and operational risk. On the other hand, Moosa and Li (2013) and Haldar and Rao (2016) identified that there is not such a relationship. Additionally, Sturm (2013) defined that banks with high liabilities to assets ratio has more operational loss than the others.

Furthermore, Habib and others (2014) identified that effective operational risk management leads to increase the performance of the banks. Similar to this study, Saeed (2015), Liu and Cortes (2015), Scannella and Brandi (2015) and Li and Moosa (2015) reached the same conclusion by using different method. In addition to these studies, De Fontnouvelle (2007) made a comparison of operational risk of 6 international banks. As a result of this comparison, it was determined that by using internal loss data, there is no significant difference between these banks. Similar to this study, Bayraktaroğlu and Yalçın (2013) also compared the banks in Turkey regarding operational risk. They concluded that the results of state-owned banks and private banks are quite different.

In addition to these aspects, it was seen that in the past, some of the studies are related to determine the effectiveness of the calculation of operational risk in the banks (Power, 2003), (Embrechts, et. al., 2003). Most of these kinds of studies aimed to analyze whether calculation methods, suggested by Basel Comittee, are adequate or not (Moscadelli, 2004), (Cornalba and Giudici, 2004). For example, Leblebici Teker and Ülengin (2005) determined that the amount of operation risk was calculated less in internal measurement approach.

After that, the concept of the studied related to operational risk started to became a suggestion of new model in order to calculate operational risk. Within this context, for instance, Neslehova, et. al. (2006), Dutta and Perry (2006), Chambers and Çifter (2007) created a model in their studies. After this period, there were also some studies which suggested banks to use internal method for this calculation (Chavez-Demoulin, et. al., 2006), (De Fontnouvelle, 2007), (Uysal, 2009). The main reason of them is that if banks can use internal data in calculation process, this provides better results.

Moreover, it can also be seen that recent studies related to operational risk analyze the influencing factors of this risk in the banks. Within this scope, for example, Bryce and others (2013) determined that there is a negative correlation between operational risk level with education and training. In addition to this study, Moosa and Li (2013) also anaylzed the influencing factors and concluded that loss severity does not depend on the size of the firms. Moreover, Sturm (2013) defined that liabilities to assets ratio is an important determinant of operational risk for European banks. Furthermore, Willesson (2014) concluded that there is a positive relationship between operational risk and the size of Nordic banks.

Research and Application

Aim of Research and Hypotheses

We tried to understand the difference in the views of internal controller/auditor and branch/call center

personnel with respect to the operational risk in our research. Therefore, in the analysis, we compared the results of these two different groups. Our hypotheses as follows;

H1: The views of both two groups regarding the operational risk knowledge level of branch/call center personnel are equal.

H2: The views of both two groups regarding the sufficiency of the trainings on operational risk are equal.

H3: The views of both two groups regarding the risk levels of the operations performed by branch/call center personnel are equal.

H4: The views of both two groups regarding the sufficiency of the control levels of to avoid operational risks in branch/call center are equal.

Research Design and Methodology

We prepared a survey for two different groups in the banks, which are internal controller/auditor and branch/call center personnel. The main aim of this study is to compare the views of these two groups with respect to the operational risk. This survey was conducted by 310 branch and call center personnel and 151 internal controller/auditor in the bank. The questions in the survey for two groups are similar. The details of them are given on the table below.

Table 2: The Questions Used in the Study

Subject	**Question Topic**		**Author**
	Branch/Call Center Personnel	**Internal Control/Audit Personnel**	
The levels of operational risk	Are your works open to mistake?	What do you think about the operational risk level of operations in the branches? What do you think about the operational risk level of operations in the call center?	Bryce et. al. (2013), Sitwat et. al. (2014), Pelit (2011), Chernobai et. al. (2011), Helbok and Wagner (2006), Erdoğan and Ülbegi (2009), Aykın and Eken (2012), Öztürk and Ulusoy (2015), Shahbaz (2013), Yirmibeş (2013)
The sufficiency of controls taken by the banks to avoid this risk	Can your mistakes be corrected easily? What do you think about the system controls taken for operational risk in the branch operations? What do you think about the authorization mechanism in your works?	What do you think about the system controls taken for operational risk in the banks? What do you think about the system controls taken for operational risk in the branch operations? What do you think about the system controls taken for operational risk in the call center? Do you think that some controls should be added for branch operations Do you think that some controls should be added for call center operations	Bryce et. al. (2013), Sitwat et. al. (2014), Chernobai et. al. (2011), Helbok and Wagner (2006), Erdoğan and Ülbegi (2009), Aykın and Eken (2012), Öztürk and Ulusoy (2015), Shahbaz (2013), Yirmibeş (2013)
The knowledge of the personnel in operational risk	What do you say about your knowledge about operational risk?	What do you think about operational risk knowledge of branch/call center personnel?	Rahman and Yazid (2015), Chernobai et. al. (2011), Helbok and Wagner (2006), Aykın and Eken (2012), Öztürk and Ulusoy (2015), Shahbaz (2013), Yirmibeş (2013)
The efficiency of the training given to personnel about operational risk	What do you say about the trainings you took about operational risk?	What do you think about trainings given to the personnel about operational risk?	Rahman and Yazid (2015), Chernobai et. al. (2011), Aykın and Eken (2012), Öztürk and Ulusoy (2015), Shahbaz (2013), Yirmibeş (2013)

Source: Authors

As it can be seen from Table 2, in the survey, we tried to analyze four different subjects, which are the levels of operational risk, the sufficiency of controls taken by the banks to avoid this risk, the knowledge of the personnel in operational risk and the efficiency of the training given to personnel about operational risk. Additionally, the questions in the survey were created according to these subjects. The questions are similar for two different groups, but there can be difference in the total number of the questions. For example, regarding the subject of the levels of operational risk, we asked two different questions to internal controllers/auditors, but one question was enough for branch/call center personnel. Moreover, on the right of Table 2, there are similar studies which also used survey method so as to analyze operational risk.

Empirical results and discussions

In analysis process, first of all, we made factor analysis in order to describe variability of the surveys. It was determined that the first survey, which was conducted to internal control/auditor, has one dimension (Table a.1). In addition to this situation, it was also defined that Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.764 and it has middling degree of common variance. Moreover, it can be seen that Bartlett's Test is less than 0.05. As a result of this analysis, we reached a conclusion that inter correlation between the variables is sufficient. The details of them are emphasized on the following table.

Table 3: Internal Controls/Audits KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,764
Bartlett's Test of Sphericity	Approx. Chi-Square	238,574
	Df	10
	Sig.	0,000

Source: Authors

On the other hand, it was identified that, the second survey, which was conducted to branch/call center personnel, has two dimensions (table a.2). Additionally, Kaiser-Meyer-Olkin Measure of Sampling Adequacy was calculated as 0.572, which means it has poor degree of common variance. It was identified that this number is lower than the value of the first group. The main reason behind this situation is that internal controllers/auditors complete the survey more accurately than branch/call center personnel. Despite this situation, it was seen that both of the values are statistically significant. Furthermore, it was also determined that Bartlett's Test is less than 0.05. Similar to the results of the first survey, it can also be said inter correlation between variables is sufficient. The details are given on Table 4.

Table 4: Branch Personals/Call Center Personals KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,572
Bartlett's Test of Sphericity	Approx. Chi-Square	369,678
	Df	10
	Sig.	0,000

Source: Authors

In addition to these results, it was also seen from Table 5 and Table 6 that the Cronbach alpha values are higher than 0.6. This situation shows us that both of these surveys are reliable.

Table 5: Branch Personals/Call Center Personals Survey's Reliability Test Result

	Cronbach's Alpha	**N of Items**
1st factor	0,76	5

Source: Authors

Table 6: Internal Controls/Audits Survey's Reliability Test Result

	Cronbach's Alpha	N of Items
1st factor	0,821	2
2nd factor	0,607	3

Source: Authors

Additionally, so as to test our hypotheses, Anova test was used. Because there is non-homogenous variance, Welch and Brown-Forsythe test was applied. In this process, Tamhane's T2 was chosen for Post-Hoc. The results of Anova were given at Table 7.

Table 7: Anova Test Result

		Sum of Squares	df	Mean Square	F	Sig.
Your knowledge level on operational risk? / Branch Personals/Call Center Personals knowledge level on operational risk?	Between Groups	91,388	2	45,694	55,007	,000
	Within Groups	387,934	467	,831		
	Total	479,321	469			
Are trainings sufficient on operational risk?	Between Groups	21,945	2	10,972	11,891	,000
	Within Groups	430,940	467	,923		
	Total	452,885	469			
Are system controls sufficient on operational risk?	Between Groups	8,668	2	4,334	4,156	,016
	Within Groups	486,994	467	1,043		
	Total	495,662	469			
Is validation process sufficient to avoid operational risk?	Between Groups	28,966	2	14,483	15,430	,000
	Within Groups	438,322	467	,939		
	Total	467,287	469			

Source: Authors

H1: The views of both two groups regarding the operational risk knowledge level of branch/call center personnel are equal.

It was defined that p-value is less than 0.05 (Table 7). Due to this result, H1 was rejected. In other words, it was determined that there are statistical differences on the views of two groups regarding operational risk knowledge level of branch/call center personnel. Internal controller/auditor group thinks that operational risk knowledge level of branch/call center personnel is less sufficient than they consider themselves. As a result, operational risk knowledge of branch/call center personnel should be improved in order to prevent any loss due to the operational risk. In this process, branch/call center personnel should understand the conditions that cause operational risk and learn the ways to control this risk.

H2: The views of both two groups regarding the sufficiency of the trainings on operational risk are equal.

It was analyzed that p-value is less than 0.05 (Table 7), so H2 was also rejected. That is to say, internal controller/auditor group thinks that trainings on operational risk are more sufficient than branch/call center personnel consider. When we think this issue together with the result of H1, it can

be said that although the trainings are sufficient, it cannot be helpful to increase the knowledge of branch/call center personnel with respect to the operational risk. The main reason for this situation is that branch/call center personnel can give less importance to this aspect. Thus, in addition to the trainings, banks should conduct some other activities, such as meeting or sending declaration to the personnel so as to increase the importance of operational risk in the eyes of these personnel.

H3: The views of both two groups regarding the risk levels of the operations performed by branch/call center personnel are equal.

It was calculated that p-value is less than 0.05 (Table 7), which means that H3 was rejected. In other saying, the views of these two groups with respect to the risk levels of the operations performed by branch/call center personnel are different. According to the result of the analysis, it was understood that internal control/auditor group considers the operational risk levels higher than branch/call center personnel think. Therefore, banks should take some precautions in order to decrease operational risk. Otherwise, banks may make a high amount of financial loss.

H4: The views of both two groups regarding the sufficiency of the control levels of to avoid operational risks in branch/call center are equal.

Similar to the other hypotheses, p-value is calculated less than 0.05 (Table 7). Therefore, H4 was rejected. As a result, it can be said that the views of these groups as for the control levels to avoid operational risk are different. According to the internal control/auditor group, these controls are less sufficient than branch/call center personnel think. When we evaluate this situation together with H3, it can be concluded that banks face with high operational risk and the controls to prevent this risk are inadequate. Owing to this aspect, it can be said that existing controls should be improved and some additional controls should be added by the banks so as to minimize operational risk.

In summary, it was concluded that the views of these groups as for operational risk are quite different. That is to say, it was defined that internal controllers/auditors look at the operational risk more negatively than branch/call center personnel. Within this scope, the personnel who control and audit operations in the bank think that the risks are higher, controls are less adequate and the knowledge of operational risk is more inadequate than branch/call center personnel think.

Conclusions

In this study, we tried to compare the views of internal controllers/auditors and branch/call center personnel of the banks with respect to the operational risk. Within this context, we made two different surveys in Turkish banking sector so as to achieve this objective. The first survey was conducted by 310 branch and call center personnel. In this survey, we purposed to determine the level of operational risk according to the personnel who perform the operation in the banks. Moreover, 151 personnel in internal control and audit departments of the banks carried out the second survey. By making this survey, it was aimed to understand the extent of operational risk according to personnel who control and audit the operations in the banks.

It was defined that Kaiser-Meyer-Olkin Measure of Sampling Adequacy number of the first group is higher than the value of the second group. The main for this issue is that internal controllers/auditors complete the survey more accurately than branch/call center personnel. Despite this situation, it was seen that both of the values are statistically significant. According to the results of the analysis, it was determined that there are differences between the views of internal controllers/auditors and branch/call center personnel. In general, internal controllers/auditors look at the operational risk more negatively than branch/call center personnel. First of all, the personnel who control and audit operations in the bank think that operational risk knowledge level of branch/call center personnel is less sufficient than they consider. Therefore, the knowledge of branch/call center personnel should be improved in order to prevent high loss in the future.

On the other hand, as a result of second hypothesis, it was determined that internal controller/auditor group thinks that trainings on operational risk are more sufficient than branch/call center personnel

consider. It means that in spite of the fact that the training given to the personnel is sufficient, their knowledge related to operational risk is inadequate. This situation shows that banks should organize additional activities in order for personnel to give more importance to the operational risk.

In addition to this situation, internal control/auditor group considers the operational risk levels higher than branch/call center personnel think. Because of this issue, banks should take some precautions for operational risk in order not to face high amount of loss. Another result of this study is that according to the internal control/auditor group, the controls are less sufficient than branch/call center personnel think. Owing to this situation, existing controls should be improved and some additional controls should be added by the banks to manage operational risk.

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Appendix:

Table a.1: Internal Controls/Audits Survey's Factor Analysis Result

	Questions	1
Attitudes	Are trainings sufficient on operational risk?	0,878
	Are system controls sufficient on operational risk?	0,754
	Are call center's system controls sufficient on operational risk?	0,788
	Are branch's system controls sufficient on operational risk?	0,695
	Is there any screen needs system controls to avoid operational risk?	0,868

Table a.2: Branch Personals/Call Center Personals Survey's Factor Analysis Result

	Questions	1	2
Training and Knowledge	Your knowledge level on operational risk?	0,918	
	Are trainings sufficient on operational risk?	0,898	
Attitudes	Are system controls sufficient on operational risk?		0,855
	Are validation process sufficient to avoid operational risk?		0,833
	Is there any suitability to correct wrong transactions?		0,503

Table a.3: Descriptive Analysis Result

		N	Mean	Std. Deviation	Std. Error
Your knowledge level on operational risk? / Branch Personals/Call Center Personals knowledge level on operational risk?	Internal Controls/Audits	151	2,83	0,898	0,073
	Branch Personals	238	3,83	0,857	0,056
	Call Center Personals	81	3,38	1,079	0,12
	Total	470	3,43	1,011	0,047
Are trainings sufficient on operational risk?	Internal Controls/Audits	151	3,84	0,841	0,068
	Branch Personals	238	3,43	0,977	0,063
	Call Center Personals	81	3,28	1,109	0,123
	Total	470	3,54	0,983	0,045
Are system controls sufficient on operational risk?	Internal Controls/Audits	151	3,84	0,841	0,068
	Branch Personals	238	3,54	1,069	0,069
	Call Center Personals	81	3,58	1,171	0,13
	Total	470	3,64	1,028	0,047
Is validation process sufficient to avoid operational risk?	Internal Controls/Audits	151	3,12	0,824	0,067
	Branch Personals	238	3,66	1,033	0,067
	Call Center Personals	81	3,6	1,021	0,113
	Total	470	3,48	0,998	0,046

Table a.4: Survey Questions for Internal Controllers/Auditors

Question 1: How long have you been in this position at the banks?

- 0-2 years
- 2-5 years
- 5-10 years
- More than 10 years

Question 2: What do you think about operational risk knowledge of branch/call center personnel?

- Insufficient
- 2
- 3
- 4
- Sufficient

Question 3: What do you think about trainings given to the personnel about operational risk?

- Insufficient
- 2
- 3
- 4
- Sufficient

Question 4: What do you think about the operational risk level of operations in the branches?

- No Risk
- 2
- 3
- 4
- Very Risky

Question 5: What do you think about the operational risk level of operations in the call center?

- No Risk
- 2
- 3
- 4
- Very Risky

Question 6: What do you think about the system controls taken for operational risk in the banks?

- Insufficient
- 2
- 3
- 4
- Sufficient

Question 7: What do you think about the system controls taken for operational risk in the branch operations?

- Insufficient
- 2
- 3
- 4
- Sufficient

Question 8: What do you think about the system controls taken for operational risk in the call center?

- Insufficient
- 2
- 3
- 4
- Sufficient

Question 9: Do you think that some controls should be added for branch operations

- Certainly
- 2
- 3
- 4
- No need

Question 10: Do you think that some controls should be added for call center operations

- Certainly
- 2
- 3
- 4
- No need

Table a.5: Survey Questions for Branch/Call Center Personnel

Question 1: In which department do you work?

- Call center
- Branch

Question 2: How long have you been in this position at the banks?

- 0-2 years
- 2-5 years
- 5-10 years
- More than 10 years

Question 3: What do you say about your knowledge about operational risk?

- Insufficient
- 2
- 3
- 4
- Sufficient

Question 4: What do you say about the trainings you took about operational risk?

- Insufficient
- 2
- 3
- 4
- Sufficient

Question 5: Are your works open to mistake?

- No Risk
- 2
- 3
- 4
- Very Risky

Question 6: Can your mistakes be corrected easily?

- No
- 2
- 3
- 4
- Yes

Question 7: If you see a problem in the system, can you give information to your superiors?

- No, never.
- 2
- 3
- 4
- Yes, certainly

Question 8: What do you think about the system controls taken for operational risk in the branch operations?

- No, never.
- 2
- 3
- 4
- Yes, certainly

Question 9: What do you think about the authorization mechanism in your works?

- Insufficient
- 2
- 3
- 4
- Sufficient